

AMENDMENTS TO THE CLAIMS

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1. (Currently Amended) A transmitting apparatus for a code division multiple access (CDMA) wireless communication system, comprising:
a signal generator for generating a modulation signal by multiplying +1 or -1 signal with a code spreader for spreading a transmit signal;
at least two transmit antennas;
a plurality of at least two RF transmitters, each of the RF transmitters operatively coupled to the a respective one of the antennas, for converting an input the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antennas; and
a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity (TSTD), wherein the switching cycle is integer multiple of the code length coupled between the spreader and the RF transmitters, for mutually exclusively switching an output of the spreader between the plurality of transmitters in non-overlapping time intervals, thereby providing transmission time diversity.
2. (Original) The transmitting apparatus of claim 1, wherein the time switching transmission controller comprises:
a controller having pre-stored switching patterns, for generating a switch controlling signal based on one of the pre-stored switching patterns, said controlling signal being generated at said fixed non-overlapping predetermined time interval; and
a switch connected between an output terminal of the spreader and an input terminal each of said plurality of RF transmitters, for switching the output of the spreader to a corresponding RF transmitter based on the switch controlling signal.
3. (Original) The transmitting apparatus of claim 2, wherein the controller comprises:
a reference cycle storage for storing a reference switching cycle value;
a counter for counting clock pulses of a base station and outputting a counted value based

on the reference switching cycle value;

a memory for storing a plurality of switching patterns and outputting one of said plurality of switching patterns based on the counted value; and

a control signal generator for generating the switch controlling signal according to the switching pattern selected from the memory.

4. (Original) The transmitting apparatus of claim 3, wherein the memory stores at

least one of a sequential switching pattern, a random switching pattern, a switching pattern with a uniform switching cycle, and a switching pattern with a variable switching cycle, and the control signal generator generates the switch controlling signal with length equal to an integer multiple of an orthogonal code length.

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Sub C1
Cont.

Claims 5-8 (Cancelled)

9. (Currently Amended) A channel receiving device in a code division multiple access (CDMA) mobile communication system, comprising:

a signal generator for generating a modulation signal by modulating +1 or -1 signal with a code;

first and second transmit antennas;

first and second RF transmitters, each of the RF transmitters coupled to a respective one of the antennas, for converting the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antennas;

a time switching transmission controller for switching the transmission signal to one of the RF transmitters in order to performing time switched transmission diversity(TSTD), wherein the switching cycle is integer multiple of the code length;

a receiver for receiving the RF signal transmitted through the antennas, the receiver at least comprising first pilot demodulator for estimating a phase of the first pilot signal transmitted through the first antenna and second pilot demodulator for estimating a phase of the second pilot signal transmitted from the second antenna;

a controller for alternatively selecting the first estimated phase or the second estimated

phase according to the switching cycle to support the TSTD reception; and
a demodulator for detecting the modulation signal with the first estimated phase or the
second estimated phase according to the selection of the controller.
a pilot channel receiver for despreading a pilot channel signal from an input signal and
estimating phase and time values;
a reception controller for selecting the estimated phase and time values according to the
switching cycle and pattern of a TSTD (time switching transmission diversity) signal from a base
station through at least two antennas at the base station; and
a traffic channel receiver for receiving the TSTD signal from the base station, detecting a
channel signal based on the estimated time value, and correcting a phase error of the detected
channel signal based on the estimated phase value, for demodulation.

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Claims 10-12 (Cancelled)

13. (Currently Amended) A code division multiple access (CDMA) channel signal transmitting method in a CDMA mobile communication system, comprising the steps of:
generating a modulation signal by modulating +1 or -1 signal with a code;
switching the modulation signal to a first RF transmitter connected to a first antenna or a
second RF transmitter connected to a second antenna with non-overlapping time intervals; and
converting the modulation signal to a radio frequency(RF) signal to transmitting the RF
signal through one of the antennas, wherein a cycle of the switching is multiple integer of the
code length.
spreading a transmit signal by a corresponding orthogonal signal for a dedicated channel;
spreading the orthogonally spread signal by a PN code; and
switchedly supplying the PN spread signal to a corresponding antenna selected from at
least two antennas in non-overlapping time intervals thereby generating a TSTD signal according
to a predetermined switching pattern.

Claims 14-16 (Cancelled)

Subsct 1

17. (Currently Amended) A channel signal receiving method in a code division multiple access (CDMA) mobile communication system, comprising the steps of:

generating a modulation signal by modulating +1 or -1 signal with a code;

switching the modulation signal to a first RF transmitter connected to a first antenna or a second RF transmitter connected to a second antenna with non-overlapping time intervals;

converting the modulation signal to a radio frequency(RF) signal to transmitting the RF signal through one of the antennas, wherein a cycle of the switching is multiple integer of the code length;

receiving the RF signal transmitted through the antennas;

estimating a phase of the first pilot signal transmitted through the first antenna and a phase of the second pilot signal transmitted from the second antenna;

alternatively selecting the first estimated phase or the second estimated phase according to the switching cycle to support the TSTD reception; and

detecting the modulation signal with the first estimated phase or the second estimated phase according to the selection.

(1) despreading a pilot channel signal from an input signal and estimating phase and time values;

(2) selecting the estimated phase and time values according to the switching cycle and pattern of a TSTD signal received from a base station through at least two antennas; and

(3) detecting an TSTD dedicated channel signal based on the estimated time value, and correcting a phase error of the detected TSTD signal based on the estimated phase value, for demodulation.

Subsct 1

Claim 18 (Cancelled)

Subsct 1

19. (Currently Amended) A transmitting apparatus in a code division multiple access (CDMA) mobile communication base system, comprising:

a signal generator for generating a transmission signal by modulating +1 or -1 signal with a code spreader for spreading a signal;

two or more transmit antennas;

C. Cook

two or more RF transmitters, each of the RF transmitters connected to a respective one of the antennas, for converting an input the signal generated by the signal generator to an RF signal and outputting the RF signal through the respective antenna; and

a time switching transmission controller for alternately switching the transmission signal to one of the RF transmitters for a fixed, non-overlapping predetermined time unit to provide time switching transmission diversity (TSTD),

wherein the switching cycle of the controller is an integer multiple of the code length.

20. (Previously Added) The transmitting apparatus of claim 19, wherein the time switching transmission controller comprises:

B1

a controller having pre-stored switching patterns, for generating a switch controlling signal based on one of the pre-stored switching patterns, said controlling signal being generated at said fixed non-overlapping predetermined time unit; and

a switch connected between the signal generator and an input terminal of each of said two or more RF transmitters, for switching the transmission signal to one of the RF transmitters based on the switch controlling signal.

21. (Previously Added) The transmitting apparatus of claim 20, wherein the controller comprises:

a reference cycle storage for storing a reference switching cycle value;
a counter for counting clock pulses of a base station and outputting a counted value based on the reference switch cycle value;
a memory for storing a plurality of switching patterns and outputting one of said plurality of switching patterns based on the counted value; and
a control signal generator for generating the switch controlling signal according to the switching pattern selected from the memory.

22. (Previously Added) The transmitting device of claim 21, wherein the memory stores at least one of a sequential switching pattern, a random switching pattern, a switching pattern with a uniform switching cycle, and a switching pattern with a variable switching cycle

Sub C17

and the control signal generator generates the switch controlling signal with length equal to an integer multiple of an orthogonal code length.

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23. (Currently Amended) A transmitting method in a code division multiple access (CDMA) mobile communication base station system, having two or more antennas and two or more RF transmitters, each of the RF transmitters connected to a respective one of the antennas for converting an input signal to an RF signal and outputting the RF signal through the respective antenna, comprising the steps of:

generating a transmission signal by modulating +1 or -1 signal with a code; and alternately switching the transmission signal to one of the RF transmitters for a predetermined time unit to provide time switching transmission diversity (TSTD) and transmitting the transmission signal,

wherein the switching cycle is an integer multiple of the code length.

24. (Previously Added) The transmitting method of claim 23, wherein the alternately switching step comprises the steps of:

generating a switch controlling signal based on a switching pattern at the predetermined time unit; and

switching the transmission signal to the RF transmitter to be connected corresponding antenna based on the switch controlling signal.

25. (Previously Added) The transmitting method of claim 24, wherein the switch controlling signal generation step comprises the steps of:

generating a reference switching cycle signal;

counting clock pulses of a base station and outputting the counted value at the time point when the reference switching cycle value is generated;

outputting the switching pattern based on the counted value; and

generating the switch controlling signal according to the switching pattern.

26. (Previously Added) The transmitting method of claim 25, wherein the switching

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pattern is at least one selected from the group of a sequential switching pattern, a random switching pattern, a switching pattern with a uniform switching cycle, and a switching pattern with a variable switching cycle, and the switch controlling signal is an integer multiple of an orthogonal code length.